

**ON-CHIP MAGNETIC FORCE ACTUATION OF
MICROCANTILEVERS BY PLANAR COILS**

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Abstract of the Disclosure

An on-chip coil is provided in a micromachined device for magnetic actuation of a nanoelectromechanical microcantilever. The novel geometry involves a three dimensional solenoid or planar coil carrying high current that 10 generates a large enough magnetic field in its close proximity to a permalloy thin film patch or columnar magnet disposed on the distal end of the piezoresistive microcantilever to effectively interact with the magnetic thin film deposited on the microcantilever. The device comprises an effective actuators which can be integrated with biofunctionalized cantilever arrays in hybrid semiconductor- 15 microfluidics devices for the analysis and detection of biological analytes.